

FLIGHT

The
**AIRCRAFT
ENGINEER
&
AIRSHIPS**

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport
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DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list:—

- Feb. 21 "Aerial Photography and Survey," by Mr. H. Hamshaw Thomas, before R.Ae.S.
- Feb. 22 "Low-Powered Flying," by Mr. W. O. Manning, before Inst.Ae.E.
- Feb. 27 "A New Type of Commercial Aircraft," by Mr. W. Sholto Sheppard, before C.U.Ae.S.
- Mar. 1 French Aero Engine Competition.
- Mar. 5 Cinematograph films, etc.
- Mar. 6 "Sound Detection," by Major Tucker, before R.Ae.S.
- Mar. 7 "Braided Rubber Shock Absorber Cord for Aircraft," by Mr. L. Rowland, before Inst. Ae.E.
- Mar. 12 "Safety Precautions in Aeroplanes," by Major J. H. Ledeboer, M.B.E.
- Mar. 20 Annual Meeting of Inst.Ae.E.
- Mar. 20 "The Report of the Aeronautical Research Committee's Panel on Scale Effect," by Capt. W. S. Farren, before R.Ae.S.
- Mar. 24 British entries close for Schneider Cup and Gordon Bennett Balloon Races.

EDITORIAL COMMENT.



UNFORTUNATELY, the Editorial pages of this week's issue of FLIGHT had already gone to press when the discussion took place that followed the resolution moved by Sir Samuel Hoare to the effect that the House affirmed the principle laid down by the late Government, that Great Britain must maintain a Home Defence Air Force of sufficient strength to give adequate protection against air attack by the strongest air force within striking distance of our shores. It has not, therefore, been possible to include, this week, a report of the proceedings, but in our next issue we hope to publish, in the normal course, a fairly full report so as to place on record some of the amazing views expressed by members and supporters of the Labour Government. Incidentally, in some ways it seems rather a pity that the task of replying on behalf of the Government should have to fall to the Under-Secretary of State for Air, and not to the Secretary of State, Baron Thomson of Cardington, but the fact that the latter is a member of the House of Lords of course made this inevitable. Otherwise we cannot help thinking that the reply would have been couched in different terms, as from our interview with Baron Thomson recently we certainly did not receive the impression that he would subscribe, even under pressure from the Cabinet, to some of the statements made by Mr. Leach.

Sir Samuel Hoare outlined the position of air strength when he came into office, and referred to the steps which the late Government had taken to remedy the intolerable position into which the country had drifted. He drew a picture, vivid and terrifying enough, but by no means exaggerated, of the dangers which might threaten London and other important centres if we neglected to provide an adequate air defence. Not because he was contemplating an air attack by our friends and neighbours, the French, but by way of drawing a comparison, Sir Samuel pointed out that at the present moment there were in France about 1,000 first-line aeroplanes, while we had only a little more than 100. Taking the French Independent Striking Force, there

were 600 machines compared with 80 home defence machines in this country. Sir Samuel also quoted the famous French war pilot Fonck, now a member of the Chamber of Deputies and Chairman of the French Aeronautical League, as stating that a force of 500 aeroplanes could in a single night obliterate a city 1 kilometre square, and in a fortnight or three weeks could wipe out a city as big as Paris.

The picture is, as we have already said, sufficiently alarming without being exaggerated, and yet, in his reply, the Under-Secretary of State for Air, Mr. Leach, said that he "refused to be alarmed about it." This equanimity may, perhaps, be explained by a statement made a little later by Mr. Leach, when he said that he "was a believer in the righteousness of France's intentions," and by a remark by Mr. Wallhead (Merthyr), who expressed the astounding opinion that "the only possible source from which danger could come was France, and it ought not to be outside the realm of statesmanship to arrange matters with our Allies."

These two remarks which may, presumably, be taken to represent the Government and Party view, indicate that the present Government, the Under-Secretary of State for Air included, has lamentably failed to grasp the fundamental facts of the case. We are quite as firm believers in the righteousness of France's intentions as is Mr. Leach, and we do not for a moment contemplate an air attack by France on this country. Nothing could be further from our thoughts. But at no period in the history of the British Empire has our safety been allowed to depend upon the goodwill of any nation, however friendly, and the crux of the whole matter is, to our way of thinking, that the present Government has evidently got into the habit of assuming that the only country within striking distance is France. While this may be actually and literally true at the present day, it is the business of a Government to look ahead and to plan for the future. And we assert without fear of contradiction that in a few, a very few, years' time it will not be true. With the development of aircraft carriers, and even of airships carrying aeroplanes or seaplanes with bombs and torpedos, the number of countries within striking distance will be vastly increased. Aeroplanes are constantly being improved, and their range is being increased year by year, and now that the possibility of refuelling during flight has been proved over and over again, first in America and more recently in France, there is good cause to believe that by this means alone the range of bombing aircraft may be vastly increased by any air force which has available a sufficient number of "tankers," quite apart from any technical development of aircraft themselves and of their engines. If the Government is going to allow itself to be lulled to sleep in the belief that France is the only country within striking distance, then this country is in grave danger indeed.

Mr. Leach's statement that the plan for the increase in the Air Force approved by the late Government will not be interfered with "for the time being," and that the Imperial Air Transport Company was

also "a legacy that would be fulfilled," provides some form of assurance that in spite of its idealistic views the Government does not intend to rush headlong into indiscriminate disarmaments. What it does, apparently, do is to expect great things from a new Washington Conference. With regard to this fatuous suggestion of reviving the old hope of limitation of armaments—especially in the air—it is significant, and somewhat of a coincidence, that there comes from America, as we write, a cablegram in which it is stated that Mr. Hughes, Secretary of State, in a letter to Mr. Fish, a member of the House of Representatives, reiterates what was said by President Coolidge in his recent speech at New York, that he did not consider it feasible at the present time to call an International Conference to discuss the further limitations of naval and land armaments. It will be observed that the letter makes no reference at all to air armaments, and it should be remembered that at the last Washington Conference it was decided—and most emphatically—that a limitation in air armaments could not be contemplated. Frankly it must be recognised that there is no method by which the construction of air fleets can be regulated. No, it is not a case in which a shout of "Glory be to God and universal peace on earth" is likely to be an antidote to the sudden appearance over our cities of a few hundred 'planes, each ready to drop a few tons of bombs, nor, as Mr. B. Turner put it in the House, is the answer to an aeroplane attack "the New Testament." The "righteousness" of a cause may be the remedy a few hundred thousand million years hence, when, as we have repeatedly argued, human nature may have entirely changed. But for the present and next few thousand generations we fancy Mr. Leach's wonderful "atmosphere" will have to consist of a striking force sufficient to anticipate any possible attack on our cities. As Capt. Eden rightly stated, we ought to have at our disposal the means to answer attack by attack. But our strength ought to be equal to forestalling any meditated attack.

In fact, even looking at the problem purely from a business point of view, the possession of an adequate air force is just as obviously necessary, and should be looked upon, as we have repeatedly pointed out in these columns and as was also pointed out by Commander Burney, as an insurance premium—and a moderate one, at that. One would think that even a Labour Government would realise this fundamental fact, but apparently it does not, certain members of it anyway. Sir Samuel Hoare's ultimate motion for the closure was not accepted by the Speaker, who expressed the opinion that the debate on a matter of this magnitude ought to be resumed when the Air Estimates were before the House. The debate was thus adjourned instead of the opinion of the House being taken there and then upon what is the vital artery in the nation's future welfare. Fortunately for the Empire, the public are not in the mood just now to accept Mr. Leach's theories upon the efficacy of relying upon "a sound and righteous cause" to repel aggressive intentions upon the part of other nations.

Honours

In the *London Gazette* it was recently announced that Pilot Officer N. Vintcent, R.A.F., has been awarded the Distinguished Flying Cross in recognition of his gallantry and devotion to duty in Iraq. Having been forced to land owing to engine trouble, he beat off an attack by hostile tribesmen with great courage and determination.

Low-Powered Flying

It is tomorrow (Friday) that Mr. W. O. Manning is reading his paper on "Low-powered Flying" before the Institute of Aeronautical Engineers. The meeting, which commences at 6.30 p.m., will be held at the Engineers' Club, Coventry Street, W.1. Tickets may be obtained from the Hon. Sec., Inst.Ae.E., 60, Chancery Lane.

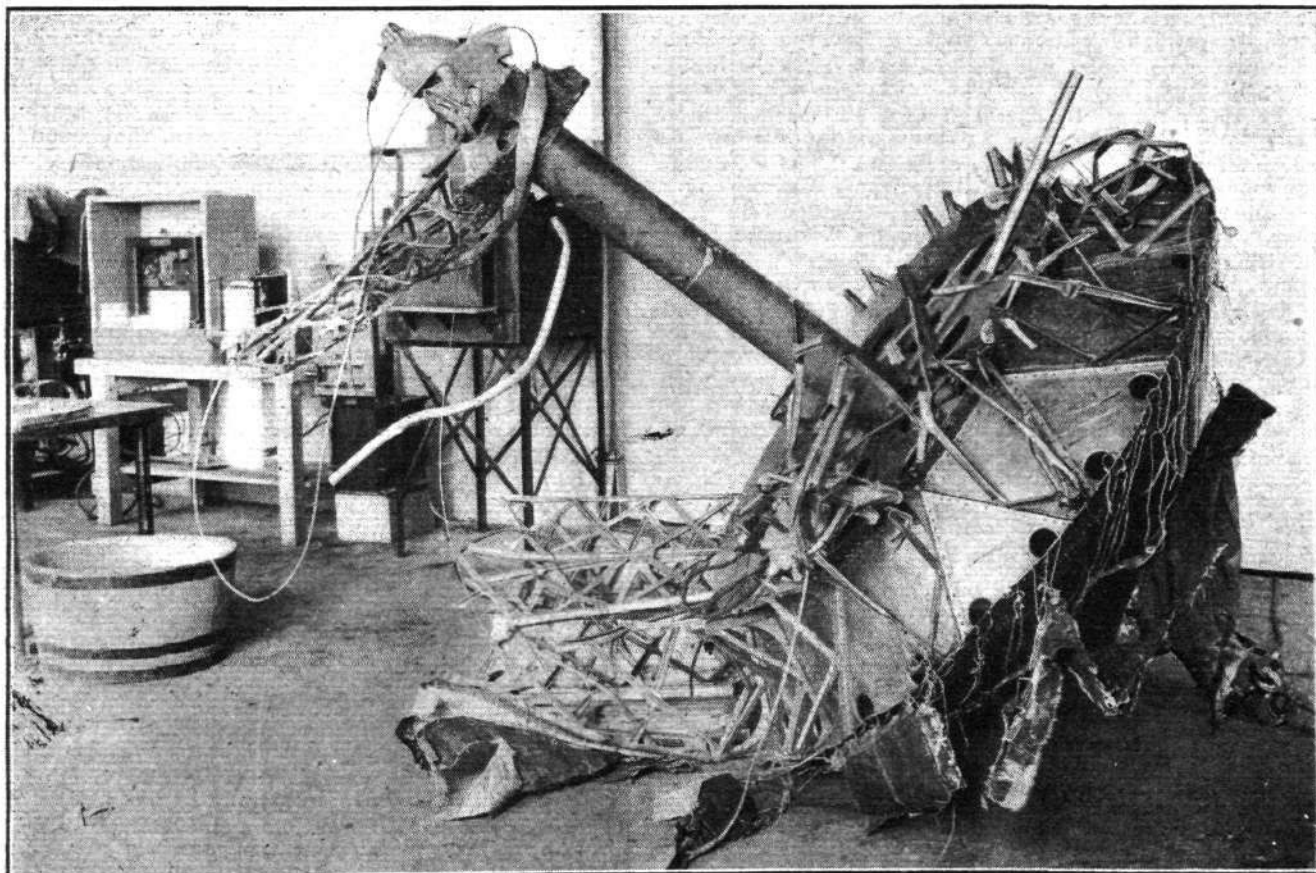
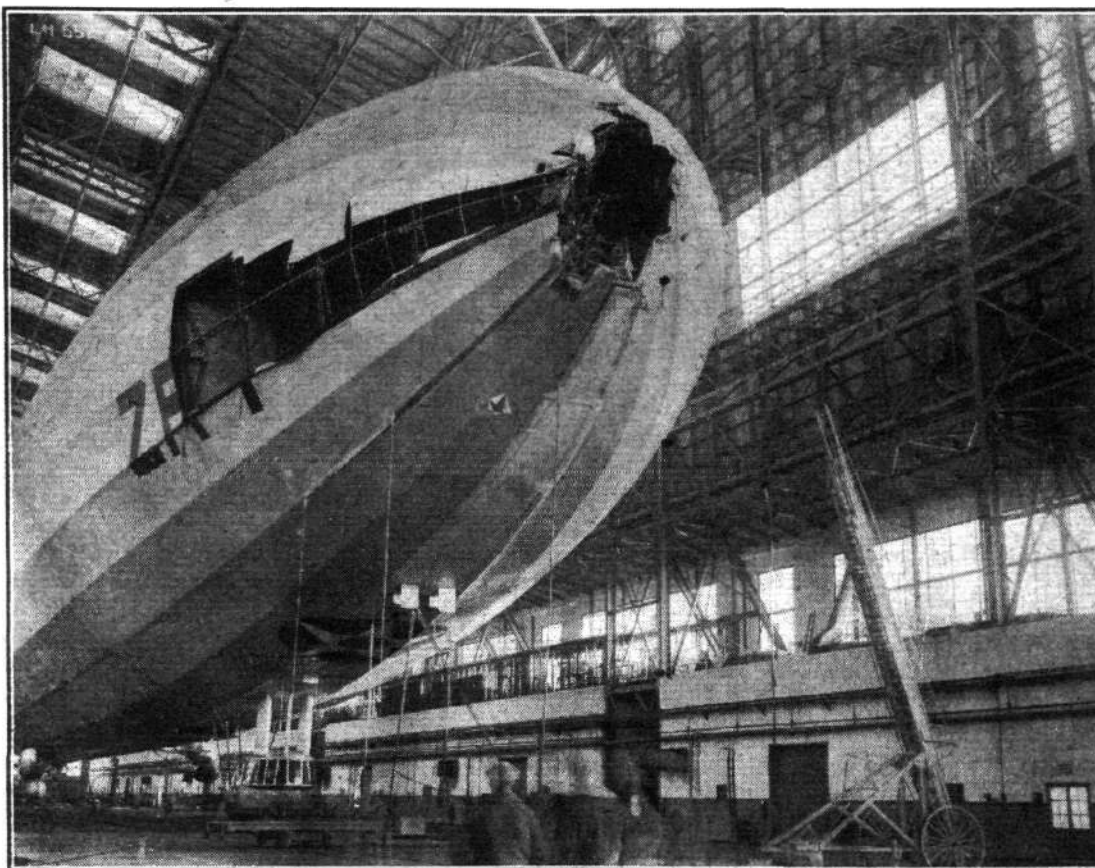
THE "SHENANDOAH" ADVENTURE

A Brief Official Account of the Accident

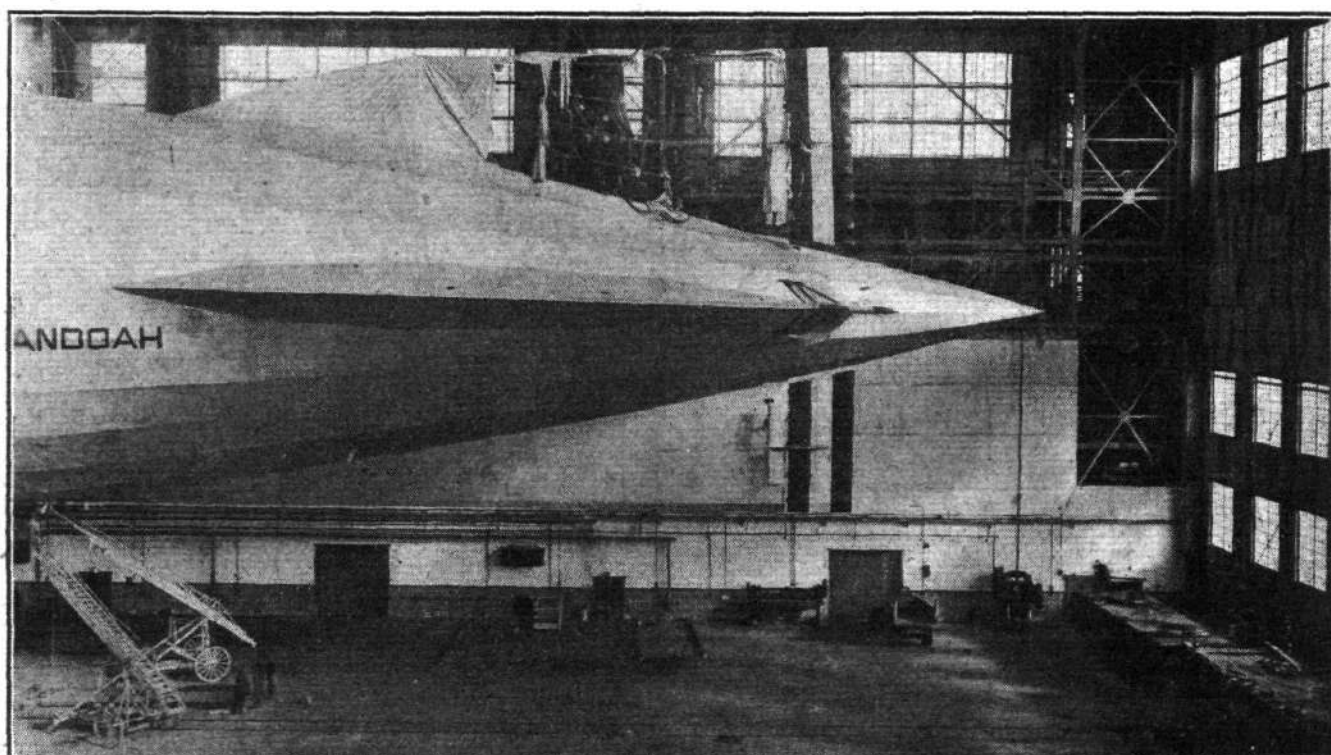
ALTHOUGH a short report of the breaking away from her mooring mast of the American airship "Shenandoah" in a gale of wind recently was published in our issue of January 24, the following official account, which has reached us from the naval air station at Lakehurst, N.J., should be of consider-

able interest. The photographs which accompanied this account give an excellent idea of the extent of the damage, and incidentally it is of interest to learn that what initially caused the airship to break away was not the strength of the wind *per se*, but the ripping of the fabric covering of the upper

The "Shenandoah" in her shed at Lakehurst, N.J., after her unpremeditated flight. Note the smashed nose and stripped fabric.



The nose cap, etc., of the "Shenandoah." This, with parts of the girders and a length of the axial wire, was torn out and left hanging on the mooring mast.



The tail of the "Shenandoah," showing the stripped upper fin which was the immediate cause of the ship's breaking away, the sudden roll causing the mooring tube to tear out.

fin, which caused the ship to roll suddenly and with such force that the mooring tube was twisted clean out of the structure and left, with a length of the axial cable that runs from nose to stern of this type of airship, on the mast.

"Starting a period of intensive training in readiness for the Polar Expedition, the ship was placed at the mast on January 12 to remain there over a period of ten days. During that time it was expected to make daily flights and to obtain valuable data as to stresses set up in the ship in varying weather conditions. Incidentally it was shown that the position of maximum stress was in the longitudinal girders about 20-25 metres from the mooring cone, and the maximum stress itself proved less than one-third of the failing load of the girder—the final galvanometer reading having been taken in a 68 m.p.h. gust about ten minutes previous to the break away. About mid-day of the 16th, a rapidly falling barometer, gave warning of approaching high winds, which increased from 27 m.p.h. at noon to a maximum of 50 m.p.h. at 7:00 p.m. with gusts varying from 35 to 75. At 6:52 p.m. in a gust of 68 m.p.h. accompanied by heavy rain, the cover of the upper fin was ripped open, and the sudden rolling of the ship twisted the mooring tube clean out of its reinforcing girders, the tube, with a length of axial cable, remaining at the mast. This cable, in its breakaway, deflated the foremost bag immediately and tore a small hole in the second bag which emptied gradually in flight and was later used by the crew, as a protecting bulkhead, to save the severe pressure on the third bag, while the ship was steering head to wind, with full power. Immediately after the break away, two winches installed in the nose carried away, but from that point no further loss was incurred, and the damage remained purely local.

" Luckily four engines were got underweigh, in less than two minutes, and after dropping three gasoline tanks to restore trim (1,100 lbs.) nothing was jettisoned.

" The ship was blown backwards at 25 m.p.h. in spite of four engines for about 100 minutes, by which time it was found possible to add the remaining two without injuring the ship's structure. Fortunately also the wind decreased and gradually veered from S.S.E. to W.N.W. during a period of about four hours, and allowed the commanding officer to get back while keeping her nose to the wind practically the whole time. At the time of her arrival the wind had dropped to 20 m.p.h., blowing dead along the hangar. Curiously enough, the girders of the upper fin did not give way until the ship was making a landing.

" The pilot to whose great skill in the first place must be given the credit of saving the ship was Captain Anton Heinen, the old Zeppelin Test Pilot, who flew the Reparation Ships 'LZ64' and '71' to England—when they were handed over. With him as first officer was Lieut. R. Mayer, who had had charge of all the detail design work on the 'Shenandoah' from her first inception, and whose knowledge proved invaluable. Other than these two officers, few of the regular skilled crew were on board at the time, and each member is entitled to great praise for his efforts. As this is the first occasion such an event has taken place, and as many surface ships were unable to ride out this particular storm, it may enlighten your readers' minds as to the strength and airworthiness of such vessels; and the ability of these crafts to ride out such buffeting without damage, when skilfully handled, should serve to show air transport in a brighter light, in spite of recent disasters."

Pulitzer Race to be Held at Dayton

This year's Pulitzer race is to be held in Dayton, Ohio, the birthplace of the Wright brothers. As in previous years, a number of other races will also be held during the same period, which will extend over several days. At present it is stated that October 2, 3 and 4 have been tentatively fixed as the dates for the great American International Meeting. The decision to hold the meeting at Dayton will provide a fitting opportunity for inaugurating the new 5,000 acres aerodrome which public-spirited citizens of Dayton donated to the American Government some time ago. It is stated that hangar accommodation will be available for several hundred aeroplanes, so that flying visitors should be sure of shelter for their machines. The amount of prize money is being increased, and it is thought that the total this year will reach 50,000 dollars (nominally £10,000). Mr. Fred. B. Patterson, President of the National Aeronautic Federation, will sail for

Europe about the middle of this month, and will endeavour to obtain European participation in the meeting. It is believed that France may enter one or two machines for the Pulitzer, but it seems doubtful whether any British entry will be forthcoming.

Jacques Schneider Cup, 1924

THE National Aeronautic Association of the U.S.A., the holders of the Cup, have notified the Royal Aero Club that this year's race will take place at Baltimore, Maryland, on October 24 and 25, 1924. We would remind our readers that British entries for this event close on March 24.

Maj. Sippe Wins

CONGRATULATIONS, and good luck in future attempts at recovering the "hidden treasure," to Maj. S. V. Sippe on winning his action in the High Courts of Justice *re* the salvage of the s.s. "Tubantia" and its cargo of gold.

AIRCRAFT CONSTRUCTION IN BELGIUM

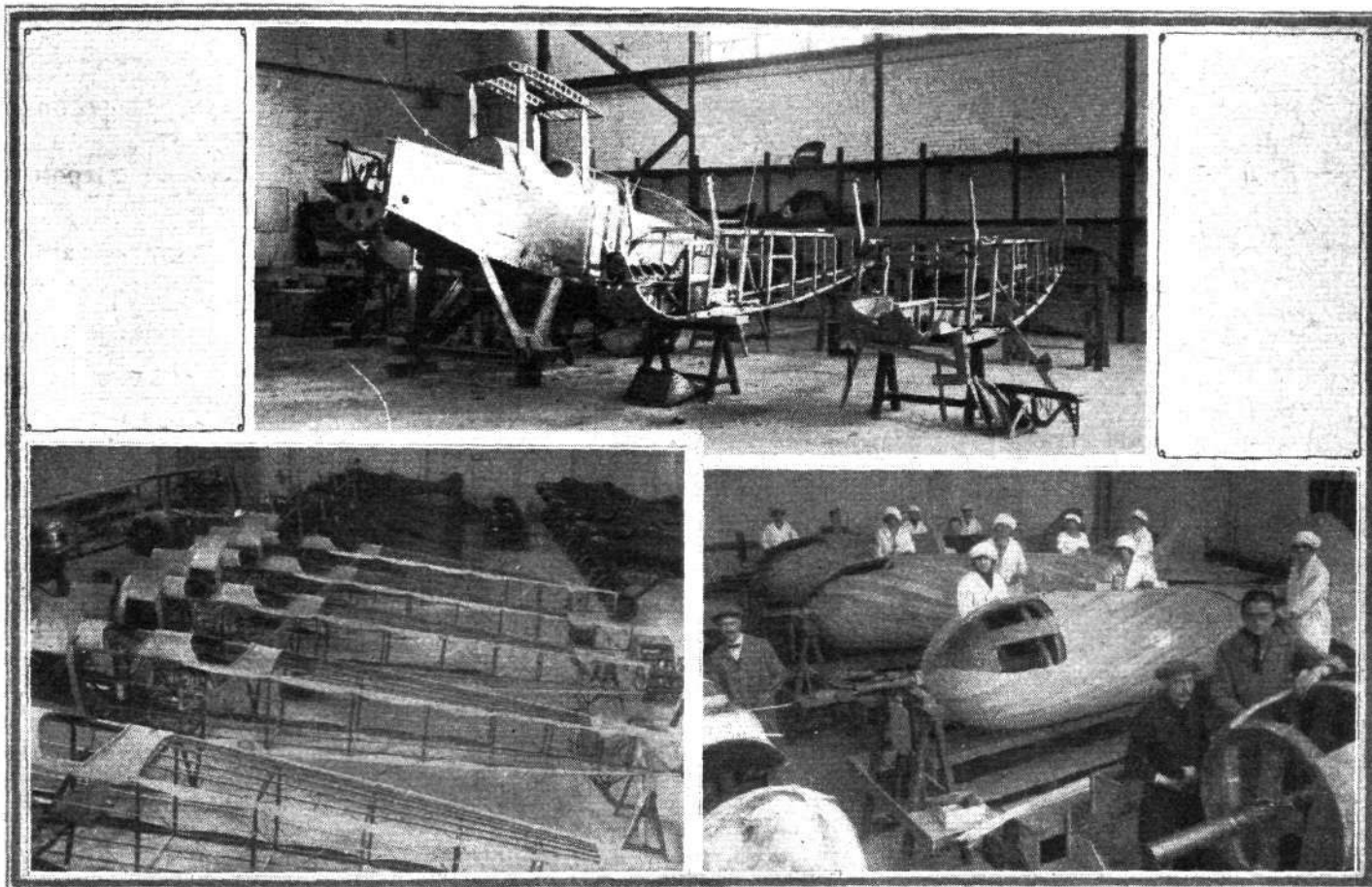
A Start Being Made by Several Firms

WORKING quietly and without much advertising of the fact, Belgium is gradually beginning to become "self-supporting" in the matter of aircraft supplies. Hitherto a number of machines have been purchased abroad for the Belgian air service, but gradually works are being established and the construction of new machines undertaken in the country. In some cases the policy has been adopted of building under licence types of aircraft designed abroad, while in others original designs are being produced. A very good friend of FLIGHT in Belgium has very kindly sent us the accompanying photographs and particulars, which should be of considerable

have also been adopted by the Military Aviation School.

Of other Belgian aviation firms, mention may be made of the "Gosselies Aviation School," under Commandant Busschaert's direction (Société Anon. d'Enterprises Générales Aéronautiques, of Charleroi). This firm is at present building a semi-cantilever two-seater monoplane, which will be fitted with a 45 h.p. Anzani as a sporting machine, and with a 70 h.p. Anzani as a dual-control school machine.

The Zeebrugge Aero Works, under the direction of Commandant Jacquet, are building an all-metal two-seater. This machine, which is of duralumin, has two seats side by side



AIRCRAFT CONSTRUCTION IN BELGIUM: Three views in the S.A.B.C.A. works at Haren-Evere. Above, erecting D.H.4 and Spad fuselages. Below, on the left, a batch of Avro 504K fuselages, and, on the right, covering Nieuport-Delage fuselages (monocoque).

interest in indicating the manner in which Belgium is gathering up the threads

The three photographs show work progressing at the well-known S.A.B.C.A. works, and it will be noticed that two of the types being built are British: the Avro training machine and the "D.H.4." The third photo. shows a number of Nieuport fuselages being covered with the tulip-wood strip used in the well-known *monocoque* construction.

At Deurne, near Antwerp, Messrs. J. Stampe and M. Vertongen are building training machines of their own design. These are mostly two-seater biplanes, with Anzani engines, and are very reminiscent of the Central Aircraft Company's "Centaur" machines, of which several were delivered by that British firm a few years ago. These school machines are being used at the Stampe and Vertongen flying school, and

in an enclosed cabin, with a third seat for a light passenger, or for luggage. It is of the thick-wing parasol type, and is to be used for touring or light air transport. The engine to be fitted is one of the new 70-80 h.p. Anzani engines, with mechanically operated inlet valves. The undercarriage has been so designed that the wheels can be quickly replaced by two duralumin floats and the machine used as a seaplane. It is expected that the machine will have a speed of about 170 kms./hour.

In addition to the above-mentioned firms, FLIGHT readers will be familiar with the constructors of the "Poncelet" and Cambier light 'planes, which have both been described and illustrated in these columns. We hope to be in a position to publish photographs of some of the new machines as soon as they are finished and ready for tests.

Franco-Roumanian Co. Buys Aircraft and Engines

THAT the Compagnie Franco-Roumaine is preparing for a busy season is indicated by the report that this company has ordered from the Caudron Co. four 3-engined machines, each fitted with one 400 h.p. Lorraine-Dietrich and two 260 h.p. Salmson engines; and from the Farman Co. some of the new 3-engined monoplanes (Salmson engines) developed from the "Grand Prix" type 4-engined machine. They have also ordered thirteen 400 h.p. Lorraine-Dietrich, and forty-seven 260 h.p. and 300 h.p. Salmson engines.

A Napier-D.H.'s 100,000 Miles of Flying

ONE of the Instone-D.H. 34 air liners ("The City of Washington"), fitted with a Napier "Lion" engine, has just completed 100,000 miles on the Croydon-Cologne non-stop air route.

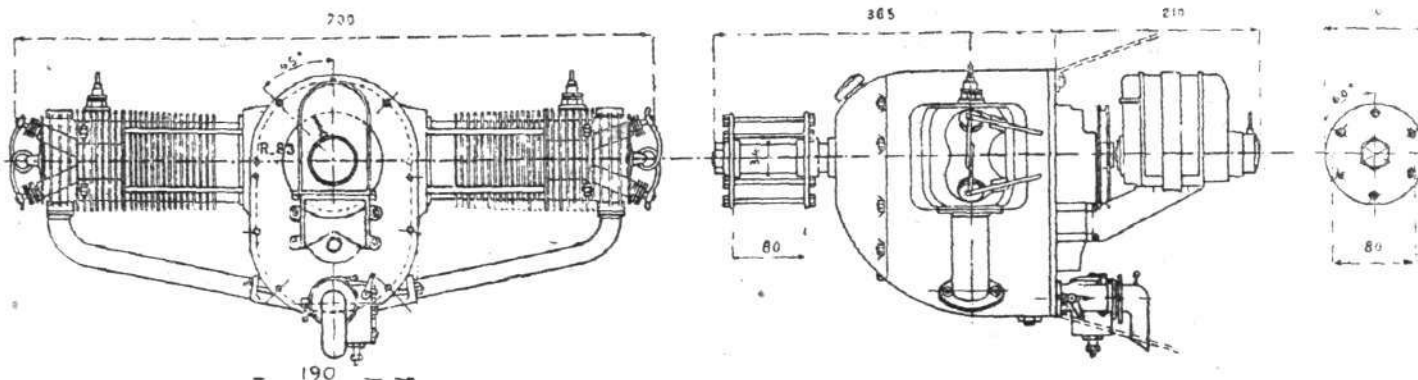
The same "Lion" engine has been used throughout, and is still in service. Except for occasional overhaul the engine has not been taken down during this period. This is certainly another example of the remarkable reliability of the Napier "Lion."

SOME FRENCH LIGHT 'PLANE ENGINES

It may be said that it was in France that the light 'plane, as a development of the glider, started its present successful contribution towards the progress of air travel. so it is only natural that France has devoted no small amount of attention to the light, low-powered engine—certainly more so than that given in other countries. We therefore think it may be of interest if we give a few brief particulars of some of these small French light 'plane engines. Unfortunately the information available is by no means complete as regards details, but the accompanying table giving the principal characteristics of the engines, together with illustrations and some notes on the main features of the various models, should give a general idea as to the development of the low-powered engine in France.

A high-tension magneto with variable advance and driven off the rear end of the crankshaft is fitted. The horse-power curve shows 12 h.p. at 1,300 r.p.m., 13 h.p. at 1,400 r.p.m., 14 h.p. at 1,500 r.p.m., 15 h.p. at 1,600 r.p.m. and 16.5 h.p. at 1,800 r.p.m. The overall measurements of the 2-A are: Width, 0.700 m.; length, fore and aft, 0.575 m.; depth, 0.365 m. We give front and side elevational drawings of the 2-A model.

Gnome-Rhone.—The Gnome-Rhone engine made its first appearance at the Paris Aero Show of 1922. It is a small two-cylinder horizontally opposed air-cooled—it is, in fact, a French-built A.B.C. It differs from the original A.B.C., however, in that a planetary reduction gear of 3 to 1 has been introduced for the airscrew drive. The crankshaft speed is



General arrangement drawings of the Clerget-Renault 2-A light 'plane engine.

Characteristics of French Light 'Plane Engines

Make and Type.	Capacity.	Bore.	Stroke.	Normal.	Rated.	Weight.	Drive.
	c.c.	mm.	mm.	r.p.m.	h.p.	lbs.	
Anzani (2-cyl. horiz. opp.) ..	1,100	90	78	1,550	10	90	Direct.
Clerget-Renault 2-A (ditto) ..	1,134	85	100	1,600	15	60	"
Gnome-Rhone (ditto) ..	398	68.5	54	3,500	10	40	Geared.
Salmson A.D.-3 (3-cyl. radial)	993	70	86	1,800	12	75	Direct.
Sergant (4-cyl. vertical)	750	54.5	80	3,200	16	100	Geared.
Vaslin (4-cyl. horiz. opp.) ..	1,094	65	85	1,800	15	90	Direct.

Anzani.—This engine is of the two-cylinder horizontally opposed cycle type, and was the original engine fitted in the Dewoitine light 'plane when Barbot took this machine up for its initial trials in April last at Toulouse. Although originally designed to give about 10 h.p. at 1,500 r.p.m. on the bench, when fitted to the Dewoitine, the r.p.m. did not exceed 1,350, with the result that only some 7 h.p. was available. This gave hardly sufficient reserve of power, and so the Anzani was replaced by a slightly larger engine (the Clerget). The Anzani was also used in the Poncelet light 'plane, but here again the power available was insufficient. Thus it would seem that this engine, in its present form, is somewhat on the small side. We have no constructional details of this engine.

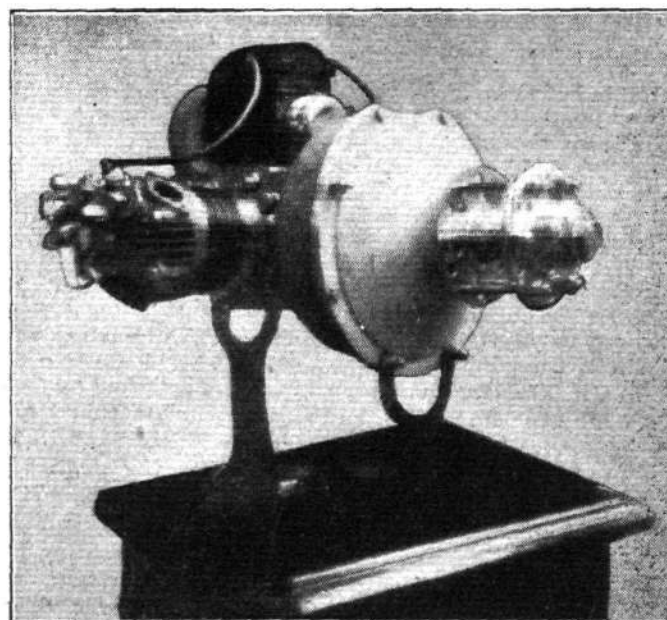
Clerget-Renault 2-A.—The Clerget engine is also of the two-cylinder horizontally opposed air-cooled type. It was originally designed some years ago—one was fitted, it will be remembered, to the first "Avionette" constructed and flown by the late M. Pischon in 1921—but last summer it was re-designed and built by the Renault Co. It was one of these engines which was later fitted to the Dewoitine when it made the cross-Channel flight and put up such a good show at the Light 'Plane Grand Prix and Vauville meeting.

In the Model 2-A the cylinders and cooling fins are of cast iron, and have removable heads of a special alloy. They are held down on to the crankcase by extension rods. The crankcase is of aluminium, being of the barrel type with end plates. Aluminium alloy is used for the pistons. The valves are located in the head, and are operated by push-rods. The crankshaft is of the two-throw type with cranks set at 180°, and the airscrew is mounted direct on to the shaft. Lubrication is by pressure, and the carburettor, which is located at the base of the crankcase, is provided with an altitude control.

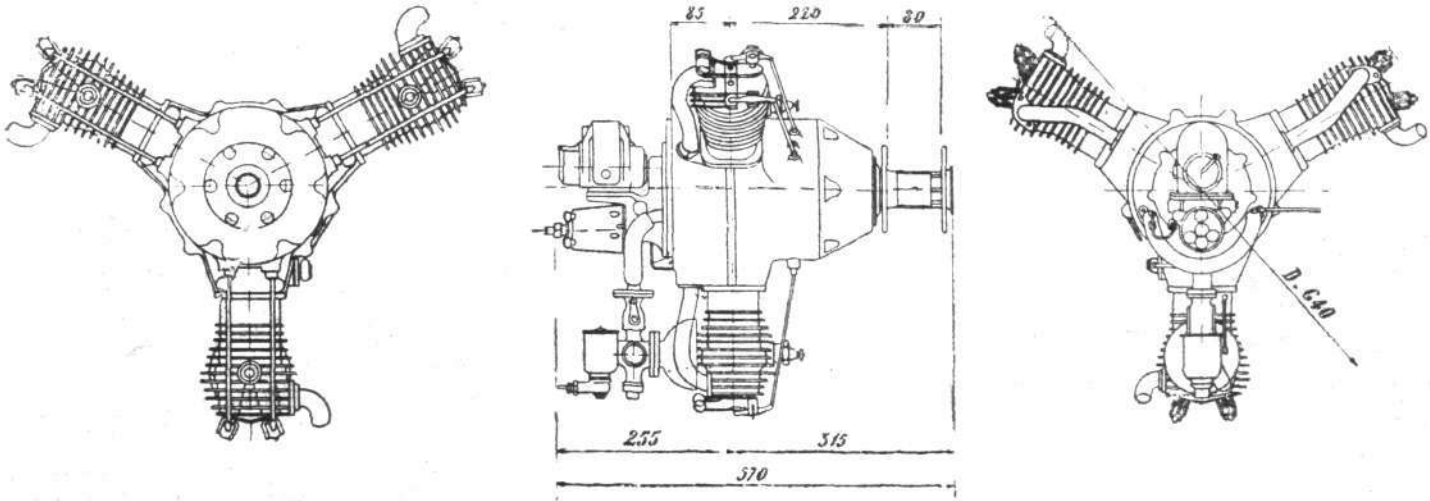
3,500 r.p.m., so that the airscrew speed comes out at about 1,170 r.p.m. As in the case of the original A.B.C. engine, an unusual feature consists of the bore-stroke ratio, the bore being larger than the stroke. As far as we are aware, this engine has not yet been employed in any light 'plane, and we believe the reduction gear has not given very satisfactory results in tests on the bench.

Salmson A.D.-3.—This engine has given very satisfactory results in practice, especially fitted in the Farman light 'plane, several notable performances falling to the credit of this combination, such as the Light 'Plane Grand Prix of 200 miles, won by L. Coupet in July last. In design the Salmson A.D.-3 follows aero-engine practice very closely—in fact, one can truly say it is a scale reduction of the "full-grown" aero engine.

It is of the three-radial (or Y) air-cooled type developing 12 h.p. at 1,800 r.p.m. and a maximum of 16 h.p. at 2,400 r.p.m. The crankcase is of the 2-piece type of aluminium alloy, whilst



The Gnome-Rhone Light 'plane engine. This is a French-built A.B.C. with the addition of a reduction gear.

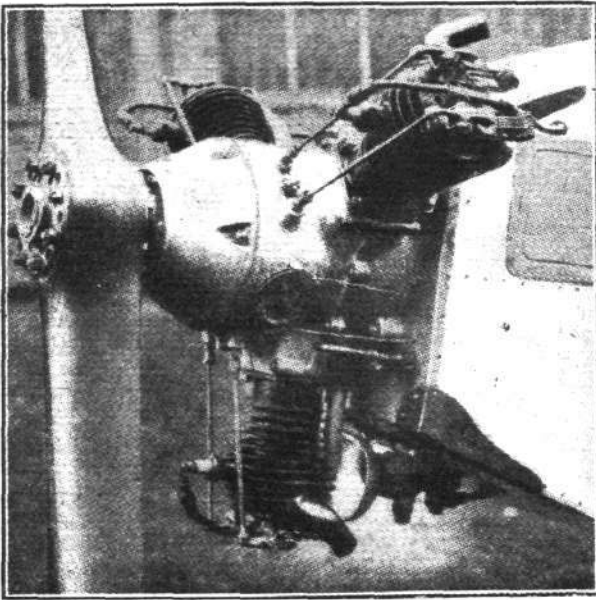


General arrangement drawings of the Salmson A.D.-3 light 'plane engine.

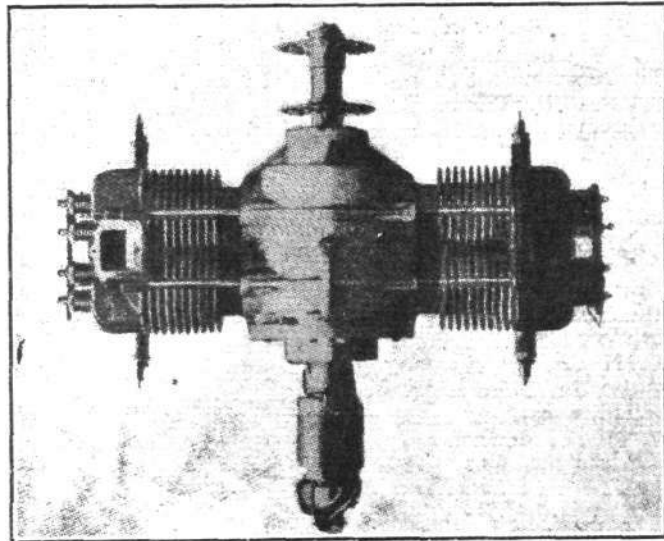
the cylinders are of steel with aluminium fins. The pistons are of aluminium alloy, and the single-throw crankshaft is of chrome nickel steel; the connecting rods are also of the latter material. The valves are located in the head, and are operated by push-rods. A Claudel carburettor, with constant level and altitude corrector, is fitted, the mixture being led to a distributing chamber formed in the rear portion of the crankcase, thence to each cylinder. Ignition is by Salmson

magneto, and lubrication is by pressure. The airscrew is driven direct. The normal petrol consumption is 250 gms. (0.55 lb.) per horse-power hour, and the oil consumption 15 gms. (0.33 lb.) per horse-power hour. The compression ratio is 5.5. The overall width and length (fore and aft) of the A.D.-3 are both within 0.650 m. and the depth is 0.550 m.

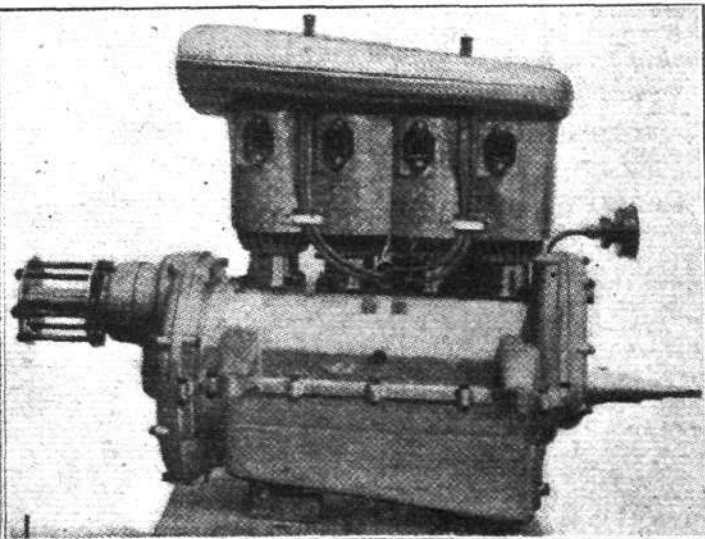
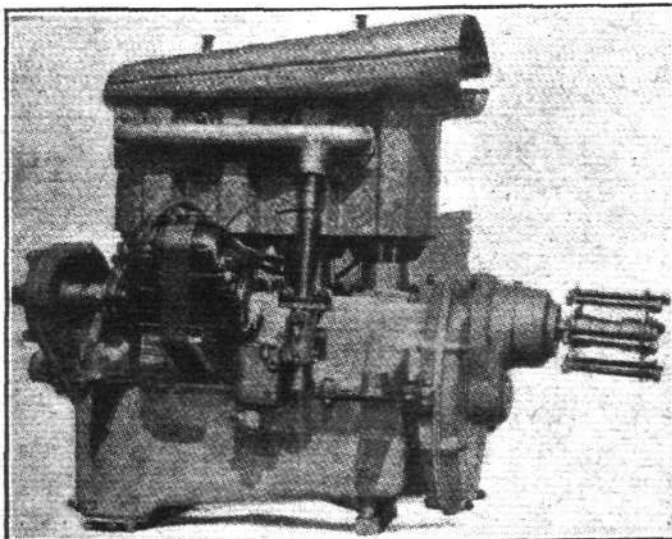
Sergant.—The Sergant is an extremely interesting and, judging from actual performance, successful little engine, differing radically from other types of light 'plane engines. It has been successfully employed in the Farman and Breguet



Another view of the Salmson 3-cyl. radial engine, fitted in a light 'plane.



The Vaslin 4-cyl. light 'plane engine—an unusual type having the cylinders in pairs horizontally opposed.



Two views of the Sergant 4-cyl. vertical air-cooled light 'plane engine.

light 'planes. The outstanding feature of this engine is that it is a four-cylinder "in-line" vertical air-cooled type, following more or less motor-car practice. Whilst somewhat on the heavy side, it would seem to possess a high degree of reliability to make up for any fault in the matter of weight. It has a fairly high crankshaft speed, viz., 3,200 r.p.m., but a special reduction gear is fitted providing three airscrew speeds for a given crankshaft speed. The three reductions are 14/35, 15/34 and 16/33—that is, airscrew speeds of 1,275, 1,410 and 1,540 r.p.m.

The crankcase is an aluminium casting, and the cylinders, which have vertical cooling fins, are bolted to it in separate units. To ensure adequate cooling the cylinders are jacketed by a metal cowling having a scoop at the forward end which directs the air flow from the airscrew round the cylinders and vertical fins. The valves are in the cylinder heads, and are operated by means of push-rods and rocker arms from a camshaft located in the crankcase. The crankshaft is a manganese steel forging. A Zenith carburettor and a Scintilla magneto are fitted. Lubrication is by pressure-gear pump, sufficient oil being carried in the crankcase for 5 hours' flight.

The overall length of the complete engine is 0.776 m., the width 0.340 m. and the height 0.565 m.

Vaslin.—The Vaslin engine, which has given successful results fitted to the Dewoitine light 'plane, is also of special interest, being of a type not very frequently employed. It is a four-cylinder air-cooled engine, with the cylinders arranged in pairs, horizontally opposed. This arrangement, it may be of interest to note, was used in the Dutheil Chalmers engine fitted to the 1908-9 Santos-Dumont "Demoiselle." As may be seen from the accompanying illustration, the Vaslin engine presents a very clean design. Each pair of cylinders, together with the cooling fins, is of the *bloc* type, with separate combustion head, machined from steel, or of cast iron.

The valves are located in the head, and are operated by push-rods and rocker arms. The magneto is driven from the rear end of the crankshaft, the sparking plugs being located in the sides of the cylinders. Lubrication is by centrifugal system with pump feed.

The normal power is 15 h.p. at 1,800 r.p.m., and 17 h.p. at 1,850 r.p.m. The fuel consumption, at full power, is 5 litres of petrol, and 225 gms. of oil, per hour.

PERSONALS

Married

Capt. RALPH C. MICHAELSON, late of R.A.F., and of the Commission to Silesia, eldest son of Mrs. Michaelson, of 36, Fitzjohn's Avenue, Hampstead, was married on February 12 at St. Paul's, Knightsbridge, to Miss GERTRUDE MARGARET FALCONER, eldest daughter of Mr. and Mrs. J. R. Falconer, of Oakhurst Court, South Godstone, Surrey.

On February 15 Mr. H. SWAN, late of the R.F.C., R.A.F., the only son of Mr. Andrew Swan, machinery merchant, Gorleston House, Hornchurch, was married to Mrs. EDITH COOPER, the widow of Lieut. J. Cooper, R.N., of Sunderland.

To be Married

The engagement is announced of Capt. T. KINSELLA BURTON, of the Cameronians and R.A.F., and VIOLET, granddaughter of the late RICHARD HIGGINS, of 28, Grosvenor Road,

W., and elder daughter of the late W. BEDDOME-HIGGINS and Mrs. HIGGINS, of 89, Cornwall Gardens, S.W. 7.

The marriage will take place on Thursday, of Capt. T. G. THORNTON, M.C., D.F.C., of 9D, Oxford and Cambridge Mansions, N.W. 1, with CATHARINE ELEANOR MARY, second daughter of Mr. and Mrs. J. H. BARTLETT, of 27, Redcliffe Gardens, S.W. 10.

Items

Maj.-Gen. Sir WILLIAM BRANCKER sailed from New York for England on the *Orduna* on February 9.

Commander DON EDGARDO VON SCHROEDERS, Naval and Air Attaché at the Chilean Legation, has left London for Rome, to attend the Naval Conference held under the auspices of the League of Nations.

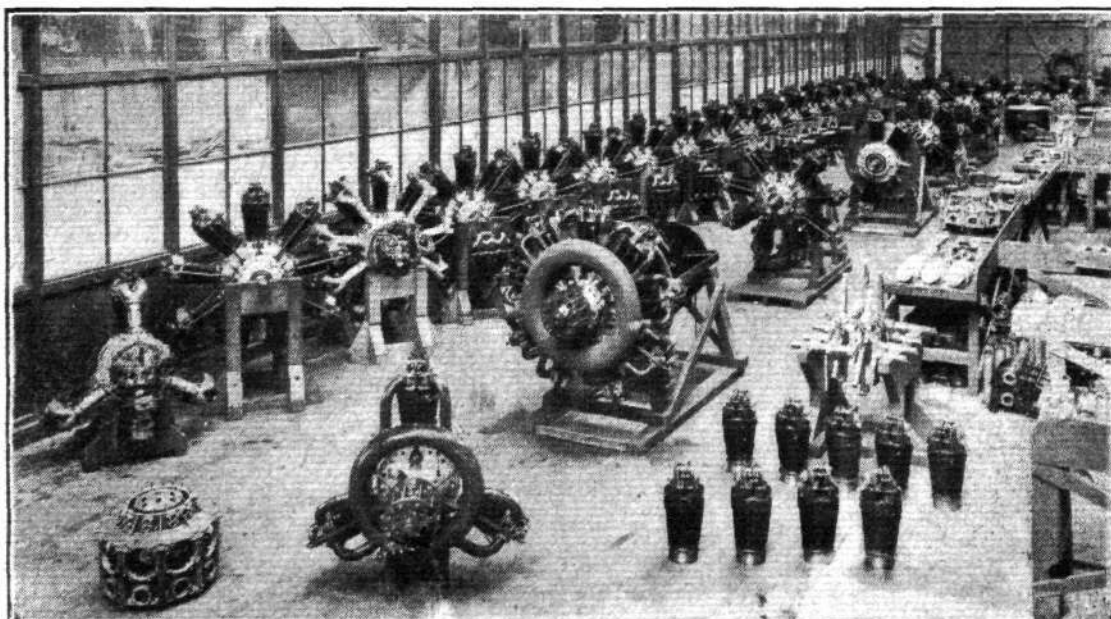
Lieut.-Colonel J. L. Travers Killed

By the death of Lieut.-Colonel J. L. Travers, who was killed while testing a monoplane at Croydon on Thursday, February 15, aviation has lost one of its pioneers and most enthusiastic supporters. Col. Travers was, when he met his death, making a trial flight on a monoplane which he and Maj. H. Cooper had designed and built to test out certain theories in connection with thick high-lift wing sections. He had, according to reports, just completed a circuit of the aerodrome when the machine suddenly dived to earth from a height of about 80 ft., and he was instantly killed.

Lieut.-Col. Travers obtained his pilot's certificate (No. 86) at the Grahame-White School at Hendon, where later he figured

prominently in many of the Hendon Flying Meetings. He then joined Short Bros. at Eastchurch, where he did much experimental or test flying. After this he joined the Naval wing of the R.F.C., then, later, the R.N.A.S. In this latter service he spent many busy years, performing much useful work at the various stations—Calshot, Felixstowe, Isle of Grain, etc.—in the technical side of aviation. After the War he joined the Technical Department of the Air Ministry. In 1922 he was appointed technical adviser in aeronautics to the Chilean Navy, and in this capacity organised the air service of that country with highly satisfactory results. He had only returned to England from Chili last month, and started work on the machine on which he was killed.

♦ ♦ ♦ ♦ ♦
♦ Bristol Aero
♦ Engines: This
♦ view in the Bristol
♦ engine shops
♦ shows a large
♦ number of "Jupiters," a couple of
♦ "Lucifers," and
♦ various parts and
♦ assemblies such
♦ as cylinders, connecting-rods and
♦ crankshafts,
♦ crank-cases, etc.
♦ It will be seen
♦ that even in peace
♦ time the Bristol
♦ engines are being
♦ turned out in
♦ considerable
♦ quantities.
♦ ♦ ♦ ♦ ♦



THE REQUIREMENTS OF A MAN-PROPELLED AIRPLANE*

By MATTHEW B. SELLERS

THE recent success achieved by the Gerhardt "cycleplane" in flying off the ground with a propeller actuated by foot-power, makes it of timely interest to consider the requirements and limitations of such a machine.

First, as to the power available, it has been found that a man can exert 1 h.p. for a short time—how long, depends on the man. One h.p. is 33,000 ft.-lbs. per minute, or 165 lbs. raised 200 ft. per minute—a 165-lb. man running upstairs at the rate of 200 ft. per minute. As we shall need all the power at our disposal, we shall assume 1 h.p. as our input.

Regarding propeller thrust, the slower the speed required to fly, the greater the thrust available. One h.p. is 375 mile/lb./hr., or, for example, 18.8 lbs. at 20 m.p.h. For a propeller having 80 per cent. efficiency, this would give 15 lbs. thrust.

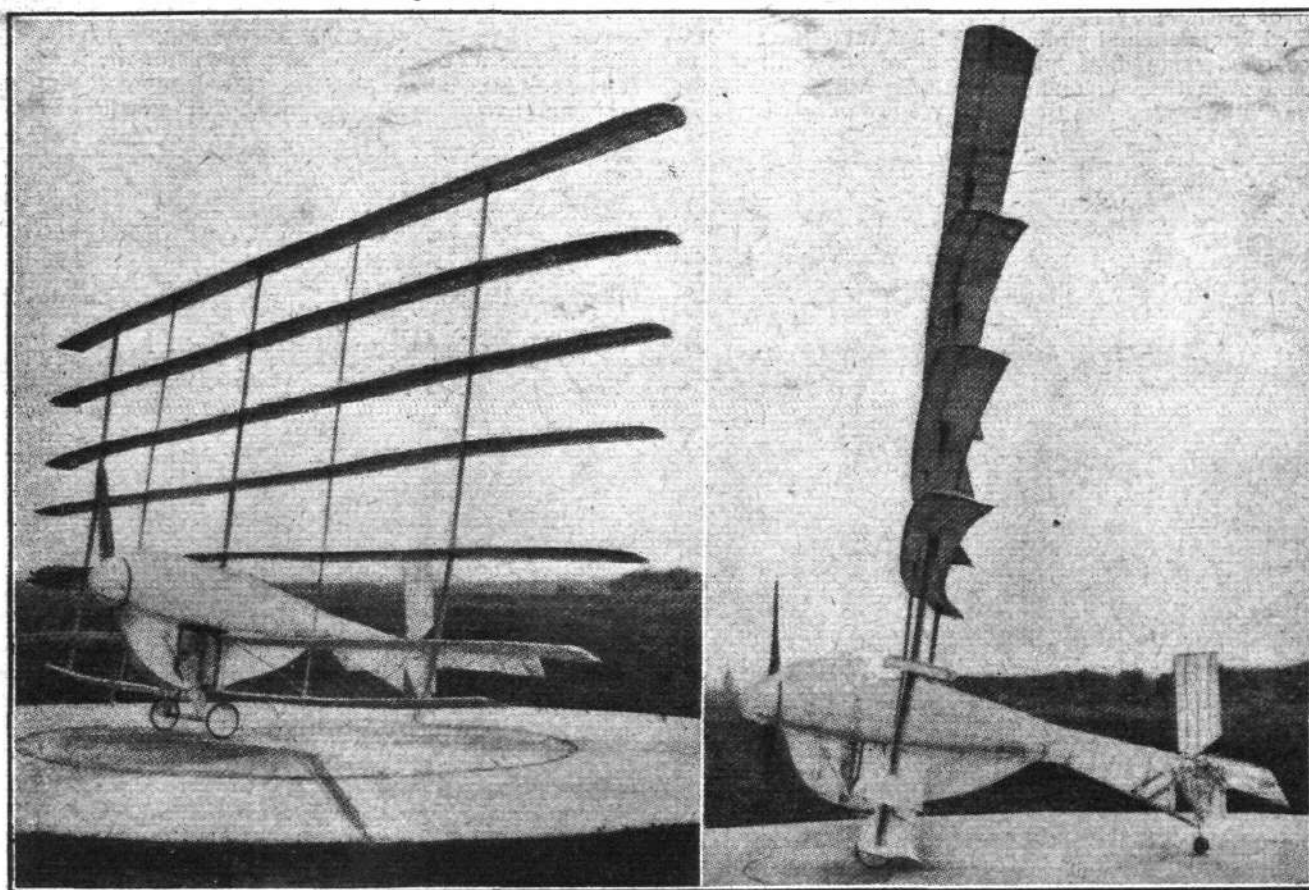
It is desirable to give a "cycleplane" the largest practicable wing area, both because it permits low speed, thus increasing thrust, and because it allows the use of a low lift coefficient and consequently a high L/D ratio. The parasite

In this case it will be seen that all resistances are greater than the available thrusts, the nearest being for $L = 0.002$.

In Table II are given the same characteristics as those shown in Table I, but referring to a machine loaded only 0.6 lb. per sq. ft. of wing area. We see from Table II that at 20 m.p.h. the resistance is 13.6 lbs., and thrust 15 lbs.—and also that at 17.5 m.p.h. we have 1 lb. leeway.

If we assumed a larger wing area for the same weight, the results would be still better, but the machine would be fragile, and unmanageable. Taking 0.6 lb. per sq. ft., 250 lbs. requires a wing area of 417 sq. ft., which would give a biplane wing about 6×36 ft., or a triplane wing about 5×30 ft. However, we should have to allow for some loss in efficiency due to biplane or triplane effect.

Care in design would be required to keep down the weight of such a machine, but even so, it should be evident that except as an interesting experiment, and as a proof that man-powered flight is possible for a few brief instants, a "cycleplane" or "aviette" would have little practical value.



The Gerhardt "Cycleplane," to which reference is made in the accompanying article by Matthew B. Sellers. This "Cycleplane" is the work of W. F. Gerhardt and E. L. Pratt, and it is reported that successful results were obtained with this machine during last summer at McCook Field, Dayton, Ohio.

resistance increases as the square of the speed, but is small for these low speeds.

Now, as an illustration, we shall consider two machines—one being loaded 1 lb. per sq. ft. of wing area, and the other 0.6 lb. It is permissible to build these machines light, and from preliminary estimates it appears that the weight can be kept within 100 lbs., including propelling mechanism. Assuming the operator to weigh 150 lbs., we have 250 lbs. total weight.

Table I gives aerodynamic characteristics of a machine loaded 1 lb. per sq. ft. of wing area. The first column shows the lift coefficient L in mile pounds per hour, column 2 the best lift drag ratio for each L , using in each case an appropriate wing section. V is the necessary flying speed, in m.p.h., for each L ; D the drag, for the corresponding L/D ratio; R the parasite resistance, in pounds, assuming a projected area of 12 sq. ft. and ratio of 1:6 for fairing, giving a 2 sq. ft. equivalent normal plane; $D + R$ is the total resistance, and T the available thrust, in pounds, for 1 h.p. and 80 per cent. efficiency.

* From an article appearing in *Aviation*, U.S.A.

At the same time, it seemed interesting to make clear the lower limits in power required to carry a man in flight without a mechanical motor, for this subject is a source of constantly-recurring "inventions" which entail expenditures of money and efforts out of all proportion to the results it is reasonable to expect. The data given in the accompanying tables should make this fact quite evident:—

TABLE I.

Aerodynamic Characteristics of a Cycleplane Loaded 1 lb./sq. ft.

L	L/D	V	D	R	D+R	T
0.0015	22	26	11.4	4.2	15.6	11.5
0.002	18	22.5	14	3.3	17.3	13.4
0.0025	14	20	18	2.6	20.6	15
0.003	12	19	21	2.4	23.4	16

TABLE II.

Aerodynamic Characteristics of a Cycleplane Loaded 0.6 lb./sq. ft.

L	L/D	V	D	R	D+R	T
0.0015	22	20	11.4	2.6	13.6	15
0.002	18	17.5	14	2	16	17
0.0025	14	15.5	18	1.6	19.6	19.3
0.003	12	14.2	21	1.3	22.3	21.1

AN INTERESTING GERMAN LIGHT MONOPLANE

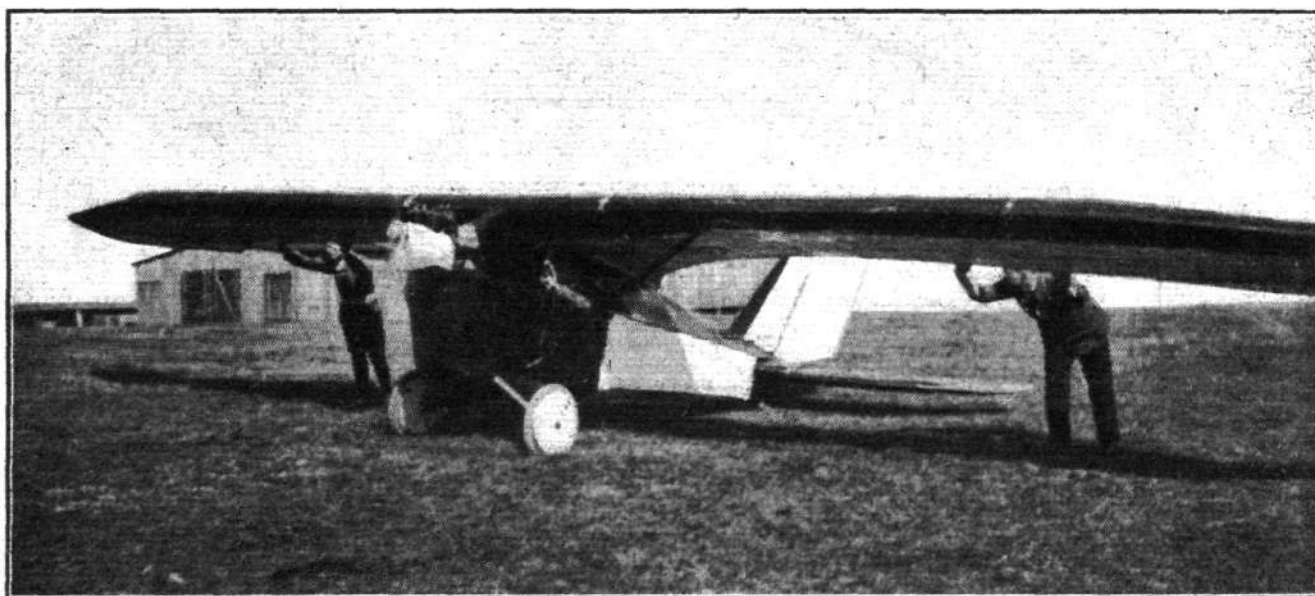
The Klemperer-Aachen with Siemens Engine

By Dipl.-Ing. ARTHUR MARTENS

[REFERENCE has been made in *FLIGHT* on several occasions to the small amount of development to which the light aeroplane has been subject in Germany, and the opinion has been expressed that this is due, primarily, of course, to the financial conditions obtaining in present-day Germany, but also to a not inconsiderable extent to the fact that for some reason or other the Germans do not appear to possess engines really suitable for use in light 'planes. We in this country made an excellent start with motor-cycle engines at Lympne last year, and it is scarcely to be doubted that the forthcoming competitions for two-seater light 'planes will produce not only excellent machines but also engines better suited to the needs of low-power flying than were last year's models. Although Germany was, perhaps, the first country to realise the need for suitable low-power engines, little practical progress has, as already mentioned, actually been made. The subject has not, however, been overlooked by a certain section of German aviation circles, mainly those originally interested in gliders and gliding. Nor has there been a total absence of German light 'planes, and we have referred to at least one in these columns, the Budig, which was flown last year with a very small engine. We are very pleased to

carrying the wheels are of streamline section. The wheels are mounted direct on these wing stumps, and there is no wheel axle. The only springing provided is that afforded by the pneumatic tyres. The undercarriage is reminiscent of that of the Dornier "Falke," except that in the latter the wing roots or stumps carrying the wheels are sprung. During the tests it has been found, however, that the arrangement adopted in the Klemperer-Aachen light monoplane is quite satisfactory. The pilot enters his cockpit through a door in the side of the fuselage. The petrol tank, which has a capacity sufficient for four hours' flight, is mounted in the centre-section of the wing. The oil tank, however, is carried immediately behind the engine.

Nearly all the metal fittings used are of Duralumin. This material is, for instance, used in the attachment of the centre-section to the top longeron. The wing is braced, in addition, by struts to the lower longerons. The leading edge of the wing is covered with 1 mm. three-ply. Celluloid is used for covering the slots occurring at the hinges of the control surfaces and at the point of attachment of the wings to the fuselage. All control cables are placed internally in order to reduce all avoidable air resistance. It is worthy of note that



The Aachener light monoplane about to start.

be able to publish this week a description of another German light 'plane, the Klemperer-Aachen monoplane, from the pen of Herr Arthur Martens, the well-known German glider pilot. Herr Martens is not only a pilot, but is also an engineer who has himself designed and built gliders and aeroplanes. He is, therefore, particularly qualified to speak on the subject of light 'planes.—Ed.]

Shortly after the close of last year's Rhön glider meeting the *Aachener Segelflugzeugbau-Gesellschaft* commenced experiments with their first light aeroplane. The designers of the machine are the well-known glider pilot Dipl.-Ing. Klemperer, and Ing. Schulz. During the flying tests the machine was piloted by Herr Hoppe, one of the Darmstadt students. The light monoplane is a development of the glider "Rheinland," built by the same firm. The "Rheinland" is a cantilever monoplane with wings of peculiar design, resembling somewhat the wings of a seagull. The fuselage is of oval cross-section, and the control surfaces are balanced. During the actual Rhön competitions this machine was not very much in evidence, but later on it put up fairly good performances piloted by Klemperer. It appeared, however, to be close on the limits of stability.

The light monoplane, which is a sister type to the "Rheinland," has wings of similar form, but the fuselage is of entirely different shape from that of the glider, being built up on five longerons. The upper longeron, which runs forward as far as the engine mounting, carries the centre-section of the wing, which is braced from the fuselage by two short struts on each side. The undercarriage springs from the lower portion of the fuselage, or rather from a main bulkhead, and the members

in the whole of the machine not a single nail is used, all wood joints being made by cold glueing.

The power plant consists of a normal two-cylinder vee motor-cycle engine manufactured by Siemens (Mabeco-Motorrad). This engine is air cooled, and its rated power is 5/11 h.p. In view of losses in the gearing, etc., it is doubtful, however, whether one can count of a maximum output of more than 9 h.p. The engine runs at 3,200 r.p.m., and the airscrew at 1,200 r.p.m. The static thrust on measurement was found to be 45 kg. (99 lbs.). The engine is started by means of a self-starter designed by Klemperer, which was found to work excellently.

The main characteristics of the Klemperer-Aachen light monoplane are as follows: Length overall, 4.5 m. (14 ft. 9 ins.); span, 13 m. (42 ft. 8 ins.); height, 1.8 m. (5 ft. 11 ins.). Wing area, 15 sq. m. (161.5 sq. ft.). Area of tail 'plane and elevator, 1.5 sq. m. (16.15 sq. ft.); area of fin and rudder, 1.5 sq. m. (16.15 sq. ft.); weight, empty, 160 kg. (352 lbs.); speed, 70 km./hour (43.6 m.p.h.).

During a flight the machine came into contact with the ground with one wing, with the result that a certain amount of damage was done which prevented the continuation of further experiments. When repairs have been effected the tests will be continued elsewhere, as weather conditions on the Wasserkuppe are not very favourable. In my opinion, it is likely that even better results will be obtained over lower-lying country than in the Rhön, which is about 1,000 metres (3,300 ft.) above sea level, although it cannot be denied that the hilly country around the Wasserkuppe has certain advantages—for instance, when starting.

LIGHT 'PLANES

By F. RADCLIFFE, B.Sc. (Vic.)

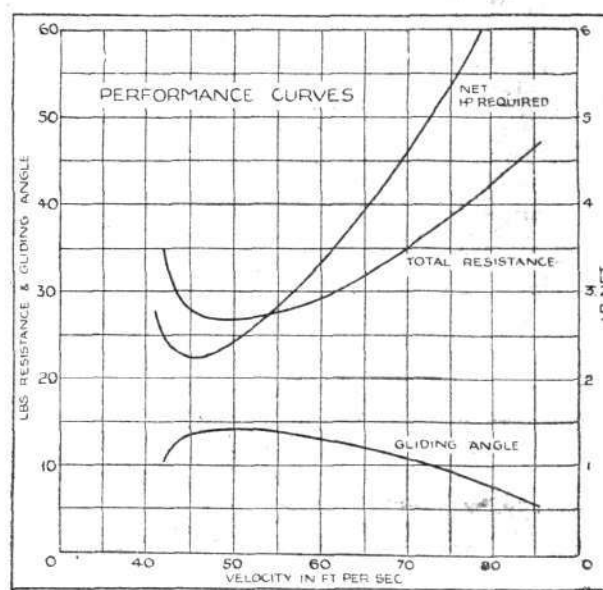
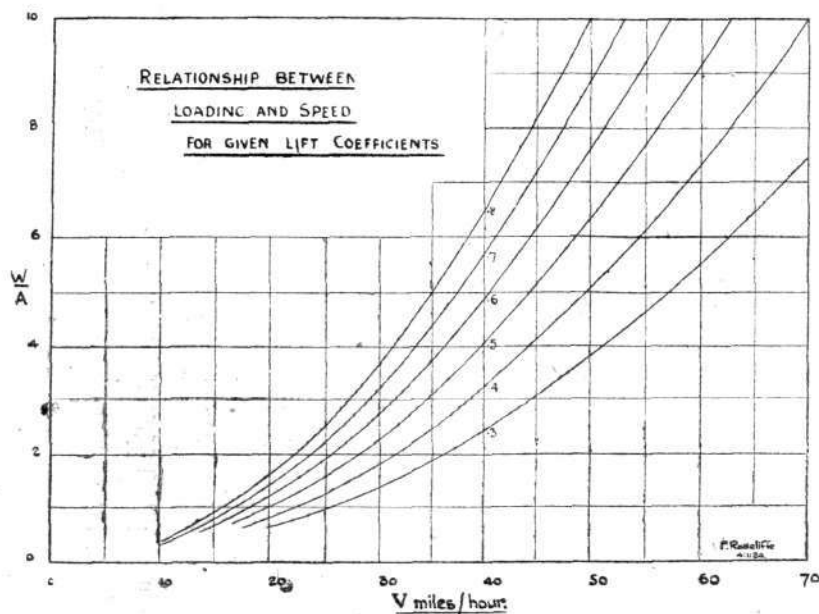
THE paper read by Mr. Radcliffe before the Hull Association of Engineers on February 9 under above title must have done a very considerable amount of good in explaining to a body of engineers not necessarily intimately connected with or interested in aviation what the light 'plane is, what it has done, and what we may reasonably expect it to do. This is all to the good, since the interest in aviation in all its forms should not, for the good of the movement, be confined to those directly concerned with aircraft design, construction and operation.

The first part of Mr. Radcliffe's paper was devoted to a brief historical review of gliding and light 'plane flying. Tracing the development from Lillienthal's early attempts, through the Rhön, Combrasse, and Itford glider competitions, the lecturer came to the first part of the paper proper—the Lympe light 'plane competitions of last year. He gave a brief outline of the prizes offered and of the machines that won them, and the performances put up. Slides were also shown illustrating the various types of machines that took part in the Lympe competitions.

The lecturer then turned his attention to the subject of

probably cost £160, so that there seemed to be a good opening for the light 'plane for research work, as its cost was not so very much higher than the cost of a well-made scale model.

As regards the commercial uses of light 'planes, the lecturer pointed out that the aeroplane had scarcely as yet had time to establish itself as an indispensable factor in commerce, and that consequently his remarks on the commercial value of the light 'plane must be to some extent speculative. What he had in mind, he said, was a machine capable of carrying, in addition to the pilot, a passenger with his personal luggage, or a useful load of 200 lbs. or so. Such a machine would be slightly larger than the Lympe machines of last year, and would be more like those suitable for the 1924 competitions. In countries where roads and navigable rivers were few or non-existent Mr. Radcliffe thought there should be good openings for the light 'plane, as also for use on extensive ranches and plantations, where the supervision of outlying districts would be facilitated by the use of light 'planes. In Great Britain, with its excellent railways and roads, the lecturer did not consider that there would be any great



LIGHT AEROPLANES: On the left a set of curves giving landing speeds for various wing loadings and maximum lift coefficients ranging from 0.3 to 0.8. On the right curves of H.P. required, total resistance and gliding angle of the English Electric Co.'s "Wren" monoplane with 398 c.c. A.B.C. engine.

the utility of the light 'plane, dividing the uses to which the light 'plane is adapted into four sections: Military, aerodynamics and research, commercial, and pleasure and sport. Dealing with the various uses in the order given, Mr. Radcliffe stated that he thought the light 'plane might be expected first to assert its value for military purposes; not so much in its direct application as in its usefulness as a means of training pilots in aerial manoeuvres and tactics. The light 'plane was, he said, capable of all the evolutions of its bigger sister, and could be used as a school machine for training in formation flying, reconnaissance, fighting, bombing and scouting. He pointed out that the light 'plane was obviously more economical for equipping training schools than the existing types costing from £1,500 to £20,000. The lecturer also advanced the theory that the light 'plane could be used as a direct military weapon, for breaking down risings by "a visit from a flight of light 'planes attached to the R.A.F." We are afraid we cannot quite agree with the lecturer on that point, since the light 'plane would scarcely be able to carry any armament likely to be of any practical value.

Under the second heading, aerodynamical and research uses, the lecturer drew attention to the difficulties of applying model test results to full-size machines, and to the utility of the light 'plane in making possible actual flying tests of a new type of machine, pointing out that while a light 'plane could probably be built for about £300, a scale model for wind tunnel tests, built to a scale of one-twentieth, would

advantage in using light 'planes for commercial purposes. He thought, however, that as an adjunct to shipping, for transferring passengers or goods from a ship to a port at which the ship was not calling, there might be some use for the light 'plane, pointing out that this suggestion was thrown out mainly as a "food for thought," and as a subject for further discussion.

The last of the four uses to which reference was made was for pleasure and popular use. Here Mr. Radcliffe thought that the light 'plane, should be capable of providing all the attractions of motor-cycling, plus a few additional ones, and he visualised the establishment of "super-garages" provided with an acre or so of tar-mac on which light 'planes could alight and from which they could start, on week-end flips to summer holiday resorts. He thought that the light 'plane should become increasingly popular, specially if the problem of control could be made a little simpler.

Having given his views on the general question of the uses of the light 'plane, the lecturer turned to the subject of performance. After stating as his opinion that two classes of machine would probably be developed (in each of which there would be a number of types), one fairly slow, for the use of those who demanded safety, reliability and comfort, and another for sporting use, capable of high speeds. As an example of the two classes of machine the lecturer mentioned the Parnall "Pixie," which, fitted with small wings, was a high-speed sporting machine, while with the larger wings fitted to the same fuselage the landing speed was reduced by 12

m.p.h. and the top speed by 15 m.p.h. The lecturer then showed a slide giving in tabular form particulars of the machines used at Lympne and of a few others. From this table it appeared that a fair average figure for the weight of a single-seater light 'plane was about 500 lbs. loaded. For the two-seaters contemplated for this year's competitions the lecturer estimated that the average loaded weight would probably be approximately 800 lbs. Assuming as a fair average figure that the L/D of a two-seater would be about 10, the lecturer arrived at the conclusion that the horsepower required for cruising at 60 m.p.h. would be 12.8 thrust-h.p., or, assuming a propeller efficiency of 70 per cent. at cruising speed, an actual horsepower of 18.3 h.p. The petrol consumption should be about 9.15 lbs. per hour, giving a mileage of 49 miles per gallon. This, the lecturer considered, compared quite well with the performance of a motor-cycle with sidecar. A table of engine data was shown (published herewith) and Mr. Radcliffe stated that if a Bristol "Cherub" was fitted, the maximum power of which was 36 h.p., the power reserve would be 50 per cent.

Engine	Capacity cu. cm.	Normal h.p.	Max. h.p.	Normal r.p.m.	Weight dry	Wt/h.p. (normal)	Petrol in. lbs./h.p.
A.B.C.	400	7	8	4,000	35	5.0	.525
Blackburne	700	20	24	3,250	70	3.5	.516
Douglas	500	17	20	4,000	68	4.0	.610
Douglas	750	22.6	25	4,000	72	3.2	—
Cherub	1,100	18	36	2,500	85	4.7	.625

Data relating to a number of high-power engines were also given, but these have not been included in our table.

Concerning light 'plane construction, Mr. Radcliffe stated that grade "B" spruce was the best material for structural members, and 1/16 in. three-ply would be suitable for stiffening up the cockpits. Metal fittings could be eliminated to a great extent if glued and bradded three-ply gusset plates were used. Metal construction, he thought, could not yet be introduced with advantage into the construction of light 'planes.

THE SOCIETY OF MODEL AERONAUTICAL ENGINEERS

The Freshman's Competition

To be held at Parliament Hill Fields on Sunday, March 30, at 11 a.m.

Rules

1. The competition is open to all members of the S.M.A.E. who did not win a first prize in any 1923 competition.
2. Any type of model aeroplane may be used.
3. Every competitor will be allowed three attempts, and the average duration performance will count.
4. The formula: Duration in seconds multiplied by the square root of the loading in ounces per square foot will be used to judge the competition.
5. The following points will be conceded to special types and will be added to the points arrived at by means of the formula: All models rising off ground receive 12 points;

double surfaced wings receive 5 points; fusilage models receive 5 points; biplane models receive 10 points; gliders receive 10 points.

6. The only exception of the above scale are compressed air-driven models, which receive no concessions whatever, being judged purely by the formula (Rule 4).

7. Competitors using compressed-air models will only be allowed to charge their containers with pumps operated by physical energy.

8. Prizes of £1, 10s. and 5s. and diplomas will be awarded at the discretion of the judges.

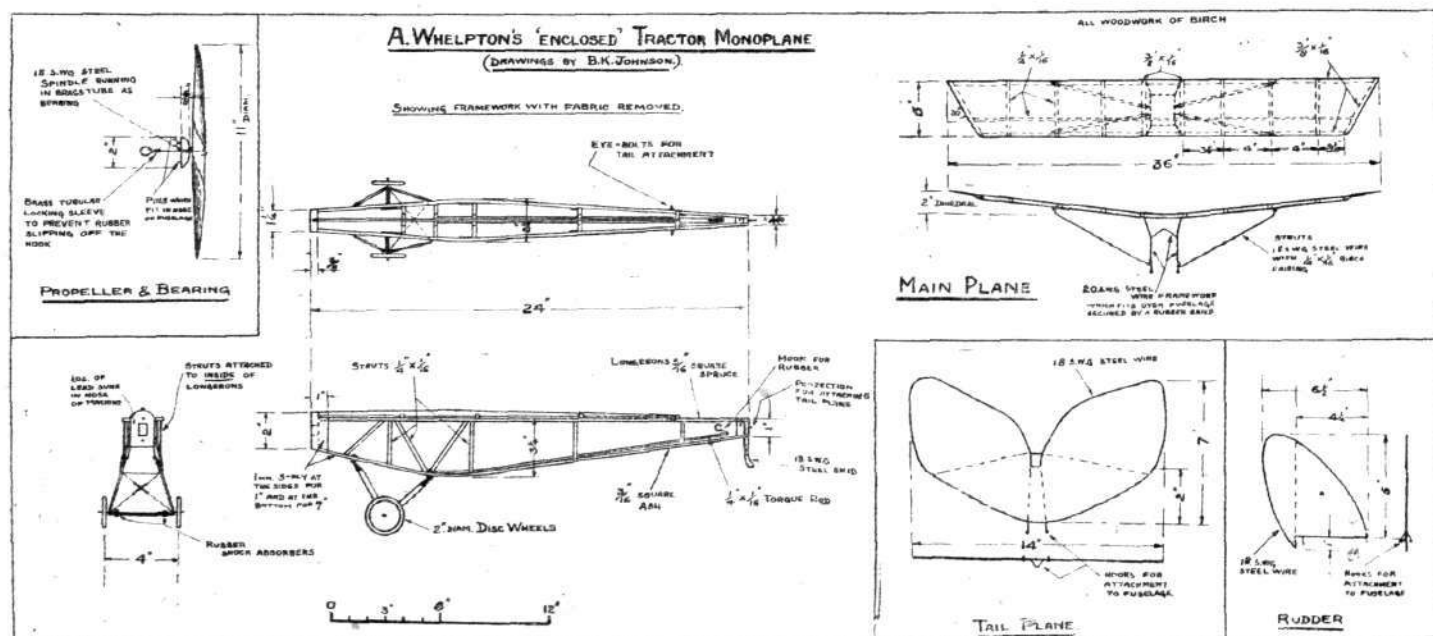
Entry forms can be received from the Hon. Competition Secretary, Mr. C. Bayard Turner, 27, Ouseley Road, Balham, S.W.12.

A. E. JONES, Hon. Sec.

THE WHELPTON "ENCLOSED" TRACTOR MONOPLANE

A MODEL which has flown regularly and in all weathers for the past two and a quarter years, and has proved thoroughly air-worthy in all respects, is shown in the accompanying detail and general arrangement drawings. Many

carried by an independent torque-rod extending along the bottom of the fuselage and attached at its forward end to one of the lower cross-struts. The wings are constructed of birch, except for the struts and "saddle" frame, which are



Detail and general arrangement drawings of the Whelpton "Enclosed" Tractor Monoplane.

noteworthy flights have also been put up with this machine used as a glider, i.e., with the tractor-screw and motor removed.

This machine, which has been constructed by A. Whelpton—a member of the Society of Model Aeronautical Engineers—is an enclosed tractor monoplane, with the main planes mounted saddle-fashion above the fuselage. The latter is built up of spruce and ash longerons as shown, and the rubber motor, consisting of eight strands of 1/4-in. strip, is

18 S.W.G. steel-wire. This latter material is used for the tail surface framework.

The following are the principal characteristics of this machine:—

Span	..	..	..	..	36 ins.
O.A. length	..	..	..	..	30 ins.
Total weight	..	..	..	..	13 oz.
Loading per sq. ft.	..	..	..	..	10 1/2 oz.
Average duration	..	..	..	..	30 secs.

THE ROYAL AIR FORCE

London Gazette, February 12, 1924

General Duties Branch

The following Pilot Officers on probation are confirmed in rank:—A. D. Baillie, R. H. Bibby, P. G. Chichester, J. W. Colquhoun, H. S. Dawe, D. E. Gain, D. E. Godwin, H. L. R. Gough, C. Mackenzie-Richards, E. Martin, M.C., J. A. Mollison, A. G. Moon, J. W. New, A. R. Perry, G. H. W. Selby-Lowndes, C. R. Troup, T. R. Wheatley, E. C. A. Wing; Jan. 14. H. N. Davies, H. M. S. Wright; Jan. 16. A. C. Addams; Jan. 17. H. D. Mitchellmore; Jan. 18. A. H. D. Livock; Feb. 13.

Medical Branch

J. J. Clarke is granted short service commn. as Flight Lieut. with effect from, and with seniority of, Jan. 28; Flight Lieut. B. F. Beatson, D.T.M. is promoted to rank of Squadron Leader on completion of 10 years' service; Jan. 31.

Reserve of Air Force Officers

G. B. Powell, A.F.C., is granted commn. in Class A, General Duties Branch, as Flying Officer on probation; Feb. 12. The following officers are confirmed in rank, with effect from the dates indicated:—*Flying Officers*: G. Cameron; Jan. 16. A. O. Bigg-Wither; Jan. 31. H. W. Owen; Feb. 7. J. C. Houston, M.C.; Feb. 10. *Pilot Officers*: A. M. Dunlop; Jan. 16. E. D. Trask; Feb. 7.

Memorandum

Capt. C. N. Downes is deprived of permission to retain his rank on conviction by the Civil Power; Jan. 7.

London Gazette, February 15, 1924

General Duties Branch

Flight Lieut. R. F. L. Dickey, D.S.C., is placed on half-pay, Scale B; Jan. 23. Flying Officer F. W. Sinclair, D.F.C., is restored to full pay from half-pay; Feb. 5.

Medical Branch

Squadron Leader.—D'A. Power, M.C., to R.A.F. Depot, on transfer to Home Estabt. 23.12.23.

Flight Lieutenants.—D. Le Bas, to R.A.F. Depot, on transfer to Home Estabt. 10.1.24. J. C. T. Fiddes, M.B., and W. D. Miller, M.B., both to R.A.F. Depot, on transfer to Home Estabt. 23.12.23. (Hon. Sqdn. Ldr.) H. B. B. Greene, to R.A.F. Depot. 12.2.24. F. T. Allen, to Aeroplane Experimental Estabt., Martlesham Heath. 7.2.24. A. E. Barr-Sim, M.B., to H.Q., Iraq. 27.1.24.

Flight Lieutenant (Q.Mstr.).—J. M. Maxwell, to R.A.F. Depot (Non-effective Pool, on transfer to Home Estabt.). 23.12.23.

Flying Officer.—T. A. G. Hudson, B.A., to R.A.F. Depot, on transfer to Home Estabt. 23.12.23. S. G. Gilmore, to No. 1 Schl. of Tech. Training (Boys), Halton. 13.2.24. T. Glynn, M.B., to R.A.F. Base, Gosport. 13.2.24.

Flying Officer (Q.Mstr.).—F. W. Goodread, to R.A.F. Depot, on transfer to Home Estabt. 23.12.23.

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Flight Lieutenants: R. B. Mansell, O.B.E., to Aircraft Depot, Egypt. 1.2.24. C. A. Ridley, D.S.O., M.C., to R.A.F. Depot on transfer to Home Estabt. 21.2.24. V. R. Gibbs, D.S.C., to No. 7 Sqdn., Bircham Newton, on transfer to Home Estabt. 17.2.24.

Flying Officers: O. E. Carter to Aircraft Depot, India. 29.12.23. J. A. Hollis and B. R. C. Coope, both to No. 20 Sqdn., India. 16.1.24. A. F. James to No. 27 Sqdn., India. 29.12.23. H. A. Boniface to No. 27 Sqdn., India. 25.1.24. E. F. Colam to No. 20 Sqdn., India. 25.1.24. E. V. H. Hudson to No. 208 Sqdn., Egypt, instead of to No. 14 Sqdn., as previously notified. 1.2.24. M. C. W. C. Flint, M.C., to No. 5 Sqdn., India. 29.12.23. A. E. Woodbridge to No. 7 Sqdn., Bircham Newton. 25.2.24. G. C. Oldham to No. 2 Sqdn., Andover, on transfer to Home Estabt. 5.3.24. A. H. Stirling to Signal Co-operation Flight, Kenley, on transfer to Home Estabt. 9.3.24. H. W. Taylor to R.A.F. Depot, on appointment to a short service commission. 11.2.24.

IN PARLIAMENT

Squadrons, Iraq and Palestine

MR. BATEY, on February 14, asked the Under-Secretary of State for Air the annual cost of keeping the air squadrons in the Far East; and when he proposes to bring them to this country?

MR. LEACH: It is impracticable without considerable labour to state precisely the cost of the air squadrons employed in Iraq and Palestine, to which I assume my hon. friend refers. The total cost of defence in the Middle East falling on Imperial funds will be found in Class V 4 of the Civil Service Estimates. Reduction in this expenditure has been continuous in the past, and further reductions are in prospect. The date on which our liabilities in Iraq will cease is not a matter for the Air Ministry.

R.A.F. Recruiting

MR. THURTELL asked whether there is a Regulation of the Ministry which provides that all candidates for the Royal Air Force must, in addition to being British subjects, be of pure European descent; and, if so, will he give the reason why the condition of pure European descent is insisted upon?

MR. LEACH: The answer to the first part of the question is in the affirmative. The answer to the second part is that the Royal Air Force is a British service, and that the mixture of European and non-European subjects in the same fighting service raises grave practical difficulties.

Iraq Air Operations

MR. LAMBERT asked whether any air machines have dropped bombs for the purpose of compelling the payment of taxes in Iraq?

MR. THOMAS: I will answer this question. The reply is in the negative. No bombs have been dropped for any such purpose. I would refer the right hon. gentleman to the statements on the subject made on behalf of the late Government on November 27, 1922, February 19, 20 and 22, and March 1, 1923. There has been no change in the position since these statements were made. Explicit instructions on the subject were sent to the High Com-

missioner on February 23, 1923, and I am satisfied that they have been strictly carried out.

Airship Line to India

MR. WELLS asked what steps he contemplates taking in order to expedite the airship line to India, seeing that unemployment in Bedford would be thereby relieved?

MR. LEACH: This question is at present under consideration by His Majesty's Government, and I regret that I am not therefore, at the moment, in a position to make any statement. The Air Ministry is, however, fully alive to the desirability of relieving unemployment in Bedford.

Imperial Airship Service

COMMANDER BELLAIRS, on February 18, asked the Prime Minister if he can give an assurance that the Imperial airship scheme that was approved in principle by the late Government, and by the Defence Committee and Imperial Conference, will be laid before Parliament for approval without further delay?

THE PRIME MINISTER: I cannot give any such assurance until the Government have had time to examine the matter. It is now doing so.

Royal Air Force (Training School, Halton)

MR. BATEY asked the Under-Secretary of State for Air, the number of young men being trained at Wendover, the number who qualified for flying last year, and the total yearly cost of that camp?

MR. LEACH: The number of boys and men at present under instruction at No. 1 School of Technical Training, Halton, is 2,132. The purpose of the school is to train boys as Royal Air Force tradesmen in such trades as fitters, carpenters, coppersmiths, etc., and they are not trained in flying. The annual cost of maintenance of the camp varies according to the number of personnel undergoing instruction, but on the basis of the number at present under training the cost, including their pay and maintenance, is at the rate of approximately £425,000 a year.

AIR SERVICES RE-UNIONS AND FUNCTIONS

Announcements for this column are invited, and inserted without charge.

March 8.—The Annual Re-union Dinner of the 55 Squadron Association will be held on Saturday, March 8,

1924, at 8 p.m. Further particulars may be obtained from the Hon. Sec., Squadron-Leader Nicholas, A.E.E. (Home) Martlesham Heath, at the earliest possible moment.

March 8.—R.A.F., India Command Re-union Dinner, Savoy Hotel.

R.A.F. MEMORIAL FUND

A MEETING of the executive committee of the Fund was held at No. 7, Iddesleigh House, Caxton Street, on February 6, there being present: Lord Hugh Cecil (Chairman), Dame Helen Gwynne-Vaughan, D.B.E., Mrs. L. M. K. Pratt-Barlow, Sir Charles McLeod (Honorary Treasurer), Air Vice-Marshal J. F. A. Higgins, C.B., Air Commodore E. R. Ludlow-Hewitt, C.M.G., Lieut. Commdr. H. E. Perrin.

The amount of grants sanctioned by the Committee since the previous meeting, held on December 19, 1923, amounting to £719 4s. 3d., was approved. The number of cases dealt with in the period named by the Grants Sub-Committee was 66, and, in addition, the Secretary dealt direct with a further 24 cases.

The Secretary drew the attention of the Committee to a very handsome sum of £341 1s. 2d., which had been contri-

buted by all ranks of the Royal Air Force units, at home and abroad, at Parade Service collections made on November 11, 1923, in commemoration of the Armistice, 1918.

The Committee were informed that the Spring term of the Vanbrugh Castle School commenced on January 8—39 boys being in attendance, which is the full number that can be admitted at the present time.

The Executive Committee considered an application from the Council of the Enham Village Centres for a sum of £500, to be extended by the Council on the erection of an R.A.F. Cottage at the Enham Village Centre, near Andover, and the grant was sanctioned on the understanding that this cottage, when ready, should always be available for the use of a man who has served in the Royal Air Force, and who is now, or may hereafter be, in training at the Enham Village Centre.



BY DOUGLAS B. ARMSTRONG

Ecuador's Air Stamps

WE understand from Mr. Alan Turton that the set of Ecuador postage stamps overprinted with various types of aeroplanes, recently referred to in this column, were a semi-official issue in connection with some demonstration flights that took place between Quita and Ibarra on the occasion of some local fêtes in August, 1923. They were used in addition to ordinary postage stamps to denote supplementary fees for air-borne correspondence according to weight, and are scarce.

Bolivian Air Post Issue

THE Latin-American republic of Bolivia is planning a special issue of stamps to mark the inauguration of a national school of aviation, the intention being presumably that the sale of these stamps should help to defray expenses of the undertaking. There are to be 100,000 copies only of the 5 bolivianos stamp, the highest denomination, and advance orders will be accepted by the Postal Department at La Paz at the rate of 9 bolivianos a set. Whether or not the stamps are intended for air postage is as yet unrevealed.

Warsaw-Dantzig Pigeon Post

WITH further reference to a recent enquiry concerning a Polish pigeon post service, we are given to understand that some such experiment was made between Warsaw and Dantzig about the end of 1922, or early in 1923, with the object of avoiding Customs difficulties on the German frontier. It is said to have been abandoned after a few days' trial, however, and so far we have not succeeded in ascertaining what special postal markings were employed (if any).

Sarandi-Montevideo Flight

A FEW more particulars of the special air post flight made between Sarandi and Montevideo (Uruguay) on the occasion of the inauguration of the national memorial on the site of the famous battle are now to hand. The flight took place on October 12, 1923, when 880 letters all told were entrusted to the pilot Adimi. All were franked with Uruguayan air post stamps, with red, blue or green overprints, the latter predominating, and in addition to the commemorative postmark of Sarandi Grande were impressed with a rectangular handstamp in purplish red, inscribed "por avion."

Spanish Air Stamp Novelties

TWO hitherto unrecorded varieties in the Spanish air post series have been brought to our notice by Mr. Alan Turton. The first is the 25 centimos with the overprint *inverted*, whilst the second is an entirely new denomination, viz., 30 centimos blue-green, bearing the "Correo Aereo" imprint.

"And that's that"

WE are indebted to Mr. C. H. R. Johnston of Amsterdam for the following explanation of the "Goteborg Luft" cancellation on Swedish stamps, which we recently referred to under the impression that it was a legitimate air post mark. He writes:—

"With reference to a paragraph in the issue of the 31st ult., *re* Swedish air post during the Gothenburg Exhibition, the facts are that 'Goteborg Luft' was the name of a small sub-post office installed in the grounds of the Aero Show, for the convenience of exhibitors and others who could receive their letters there, and dispatch telegrams, etc. Similarly there was another branch post office at the aerodrome at Torslanda, which was called 'Goteborg Flyg,' and used for similar purposes.

"The only air post stamps I have seen are those used the year before last for the routes Malmö-Kopenhagen-Hamburg, and were the ordinary stamps, overprinted 'Luftpost.'"

IMPORTS AND EXPORTS, 1923-1924.

AEROPLANES, airships, balloons and parts thereof (not shown separately before 1910). For 1910 and 1911 figures see "FLIGHT" for January 25, 1912; for 1912 and 1913, see "FLIGHT" for January 17, 1914; for 1914, see "FLIGHT" for January 15, 1915; for 1915, see "FLIGHT" for January 13, 1916; for 1916, see "FLIGHT" for January 11, 1917; for 1917, see "FLIGHT" for January 24, 1918; for 1918, see "FLIGHT" for January 16, 1919; for 1919, see "FLIGHT" for January 22, 1920; for 1920, see "FLIGHT" for January 13, 1921; for 1921, see "FLIGHT" for January 19, 1922; for 1922 see "FLIGHT" for January 18, 1923; and for 1923, see "FLIGHT" for January 17, 1924.

Imports.		Exports.		Re-Exports.	
1923.	1924.	1923.	1924.	1923.	1924.
Jan. .. 466	2,213	60,079	52,239	280	2,219

PUBLICATIONS RECEIVED

American Aeronautical Safety Code. Part 5.—Airdromes and Airways. The Society of Automotive Engineers, Inc., 29, West Thirty-ninth Street, New York City.

Ergebnisse der Aerodynamischen Versuchsanstalt zu Gottingen. Parts I and II. By Dr. L. Prandtl. R. Oldenbourg, Gluckstrasse 8, Munich, Germany.

Aeronautical Research Committee. Reports and Memoranda. No. 880 (E.8).—Flight Tests with R.A.E. Electrical Indicator. June, 1923. Price 1s. 3d. net. No. 881 (Ae.112).—The Efficiency of a Tandem System of Airscrews. By H. Glauert. May, 1923. Price 3d. net. London: H.M. Stationery Office, Kingsway, W.C. 2.

Department of Overseas Trade. Report on the Economic and Financial Conditions in Brazil, September, 1923. By E. Hamblough. London: H.M. Stationery Office, Kingsway, W.C. Price 3s. net.

Official Gazette of the United States Patent Office, January 22, 1924. U.S. Patent Office, Washington, D.C., U.S.A.

Handbook on the L.B. Type Aero Camera. Air Publication 79. Air Ministry, February, 1921. London: H.M. Stationery Office, Kingsway, W.C. 2. Price 3s. 6d. net.

The 100 h.p. "Bristol" Lucifer Radial Air-cooled Aero Engine. The Bristol Aeroplane Co., Ltd., Filton House, Bristol.

Catalogue.

A.C. Cars, 4 and 6-cylinder. A.C. Cars, Ltd., Thames Ditton, Surrey.

AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: cyl. = cylinder; I.C. = internal combustion; m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

APPLIED FOR IN 1922

Published February 21, 1924

- 28,455. U. ABATE. Wings for aircraft. (187,617.)
29,392. A. H. R. FEDDEN, L. F. G. BUTLER and BRISTOL AEROPLANE CO., LTD. Gas or air distributors for I.C. engines of the radial-cylinder type. (210,170.)
29,912. E. BONN. Aeroplanes. (210,181.)
33,730. E. A. JONES and A. N. KINGWILL. Attachment of banners, etc., to aeroplanes. (210,239.)

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The Aircraft Engineer and Airships

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